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A CONTRIBUTION TO THE HISTORY OF EVOLUTION.

The Coming of Evolution. The Story of a Great Revolution in Science. By Prof. J. W. Judd, C.B., F.R.S. Pp. iv+171. (Cambridge Manuals of Science and Literature.) (Cambridge: University Press, 1910.) Price 1*s.* net.

SO much has been written within the last few years about the history of evolution and its founders that the first question that arises on meeting with the title of this new work is whether it is possible to say anything new upon a subject which has already been dealt with so fully by the founders of the doctrine themselves, or has been handled from so many different points of view by the historians of science and philosophy. The title of the little volume under notice need not, however, act as a deterrent, because in the first place the name of the author will command the confidence of scientific readers, and, in the next place, because, in the words of the general prospectus, the series of small manuals to which it belongs is

> "not intended primarily for school use or for young beginners. The educated reader often experiences a difficulty in obtaining short books in which recent discoveries or modern tendencies are treated in a semi-popular and broad style."

With the objects thus set forth we are in complete sympathy. There is ample scope, not to say a crying need, for the authoritative enlightenment of the public mind on scientific questions. With respect to the present contribution to the series it is only necessary to remind readers of the fact that Prof. Judd is among that small and diminishing group of men who can claim to have been personally acquainted with Scrope, Lyell, Darwin, and Huxley, and whose qualifications for instructing the public on that subject which has been placed in his hands are therefore of an exceptionally high order.

By "The Coming of Evolution" the author means both the preparatory work of the great pioneers in geology, such as Hutton, Scrope, and Lyell, and the history of the revelation of the working mechanism of organic evolution by Darwin and Wallace. Of course, there is not much scope for novelty as regards the main facts in such a work since most of the materials have been public property for many years. It is in the handling of the material, in the presentment of the history and in the personal touches which here and there enliven the story with actual reminiscences that will be found the chief interest and value of this fascinating little book. As a geologist it is but natural that the author should bring into prominence the achievements in that domain, and especially those of his own master, Lyell, whom he places as the founder of inorganic evolution side by side with Darwin as the founder of organic evolution. With what feelings do we now read of the great struggle—rapidly passing into ancient history—between uniformitarianism and catastrophism, of the pitying contempt with which many of his contemporaries regarded "poor old Lyell's fads," and of the nervous caution which at that period was necessary in order to circumvent the *odium theologicum.* It may have been excusable in those days to regard the uniformitarianism of Lyell as synonymous with evolution. Yet it must not be forgotten that this inorganic evolution deals only with the geological record. Whether catastrophism in any form occurred during the period represented by that record is a matter of geological evidence, and it is with the geologists that the interpretation of the evidence rests. The old view of terrestrial catastrophism has certainly been slain; nevertheless, after the heat of the fray, are we not justified on calm consideration in rejecting the view that catastrophism and evolution are antagonistic and irreconcilable? The shedding of moons by planets, the outburst of temporary stars and other cosmical phenomena of castastrophic magnitude would appear to indicate that nature's operations are not always carried out by retail instalments. Evolution *per saltum,* so far as the geological record teaches, may be ruled out; nevertheless there was a period antecedent to that record, and catastrophic development must be reckoned with as part of the evolutionary machinery of the cosmos.

Thoughts of this kind and many other suggestive ideas will be prompted by the perusal of Prof. Judd's condensed history. There are many points upon which the various classes of readers to whom the book appeals could enlarge, and there is very little scope for criticism in the usual acceptation of the term. Prichard, who in some measure forestalled Galton and Weismann, did not spell his name Pritchard. The statement (p. 155) that "the inheritance of acquired characters and similar problems were constantly present to Darwin's ever-open mind" may be challenged, because—to our everlasting regret—this question did not take an acute form until after Darwin's death. There is only one passing allusion to the subject in the "Origin of Species" (sixth edition, p. 33), where it stated that such "'variations' are supposed not to be inherited," but Dr. Francis Darwin informed the writer some time ago, when the passage was brought under his notice, that he was unable to throw any light upon the source of his father's authority for the statement, nor has the present writer been able to ascertain by whom this view was held in Darwin's time. Perhaps some of the readers of this notice may be able to supply the necessary information.

But these are only small points. From what has been said concerning the volume as a whole it is evident that we are indebted to the author for a most readable and instructive summary, which appeals not only to the educated public for which it is intended, but which ought to be read, and read carefully, by students of natural science. Prof. Judd, upon whom many of the present generation of geologists can now look as their teacher, survives as a living witness of that great campaign, carried on in the arena of science, which resulted in the overthrow of the ancient cosmogony and the demolition of that narrow teleology which hampered scientific progress in every

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direction down to the middle of the last century. It is well that he has given us this short epitome with the history of modern evolution still fresh in his mind, for the present-day student is apt to forget the services of the great masters who fought and won on his behalf that battle which swept away the barriers interposed in the path of scientific progress by prejudice and bigotry, and opened up illimitable fields for cultivation by later generations.

R. MELDOLA.

EDUCATION AND ENVIRONMENT.

Educational Aims and Efforts, 1880–1910. By Sir Philip Magnus, M.P. Pp. xii+288. (London: Longmans, Green and Co., 1910.) Price 7*s*. 6*d*. net.

IT has been recently pointed out by a distinguished educationist how the opening of each of the last four centuries has been associated with far-reaching educational reforms, and how the beginning of the present century has seen for the first time a determined effort to grapple with the whole problem of national education in England, in all its grades, as one thing. The present moment, therefore, seems a fitting opportunity for Sir Philip Magnus to have collected together some of his more important contributions to educational progress, which have been rendered the more interesting and the more valuable by a prefatory series of essays dealing with several branches of educational activity.

It is, of course, easy to be wise after the event, and especially is this true in the subject under consideration, which, if it is regulated as it presumably is, or should be, by certain fixed principles, yet the factors on which these principles depend, and the data on which they must be founded, are so vague, so changeable, and so difficult of definition, that possibly much may be said in mitigation of the blunders which people in high places have made in the past. None the less, it is difficult to put forward a national defence for the neglect of educational reform on broad scientific lines, and so long as this sphere of national activity is regarded as the shuttlecock of party politicians, it is hopeless to expect a well-defined policy which will be conformable to the changing conditions of changing times.

When the history of that great movement which was started by the Education Act of 1870, and vitalised and broadened by the Act of 1902, comes to be written, after its effects have been properly defined and the results can be assessed, it will be seen more clearly than can at present be done the extent to which the nation is indebted to the labours of a body of men, who were responsible in a far larger measure than is commonly appreciated for the essentials of the reforms, and among the names of these assiduous workers that of Sir Philip Magnus will occupy a distinguished place. In some way he has been connected with nearly every branch of educational work during the last thirty years, and although in the earlier days of what may be termed the forward movement, he was frequently in the minority, events have shown that the minority is not always wrong, and it is due largely to the zeal with which he and others, whose names are not less prominent, pleaded for the recognition of environment as one of the essential factors in determining the aims and ideals of any educational policy, that so many of the latter-day reforms are due. The characteristic, however, which distinguishes the author of "Educational Aims and Efforts" from some few of his fellow-reformers, is a sense of proportion, combined with a breadth of outlook, which gives to his utterances a value denied to others.

To attempt in the small space at our disposal to deal in any detail with the subjects comprised in the present volume is out of the question. To do so adequately would involve a survey of the educational history of thirty years. The important part which Sir Philip played in the advancement of technical education is too well known to require notice, but in these days when the cultivation of manual dexterity and the practice of scientific method are beginning to be regarded as within the scope of the ordinary elementary school, it is interesting to recall some of the earlier utterances of Sir Philip Magnus on those points, made in the days of payments by results. Secondary education and university reform are also indebted to him in a large measure, and the views which he put forward in 1888 as to girls' education "demanding full and careful consideration from the point of view of suitableness to woman's wants, woman's occupations, and woman's mission in life," in spite of the progress which has been made in this direction in the last decade, hold with equal force to-day.

To those who take a broad view of education as something that is inextricably bound up with the social fabric, the essay on "Social Changes and School Work" will be regarded as perhaps the most important in the whole volume, and one cannot but recognise, in spite of the controversial issues which it raises —the consideration of which would demand an essay in itself—that the great upheaval of late years in the social condition of our wage-earning classes "renders it necessary that we should reconsider by the light of these changes the foundations on which our present system of education is raised." From the point of view of teacher and administrator alike the problem is rapidly entering on a new phase; and although no one can predict with certainty what the next decade may bring forth, it seems clear that, in the clash of opposing tendencies, the attitude of uncompromising hostility to the larger and more complex requirements of modern conditions and civic responsibilities must give place to a spirit of scientific inquiry as to the most effective and economic method of coordinating educational aims with national ideals. Education is at present far from being an exact science; but there is no reason why it should remain an aimless experiment of misdirected zeal with the welfare of the rising generation.

We may perhaps be allowed to express the hope that the author will return to this problem at an early date, and in the meantime can only trust that the essay will receive that earnest consideration which it demands in view of the rapidly changing phases of social life and of the child's altered relation to the State.

F. H. N.

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